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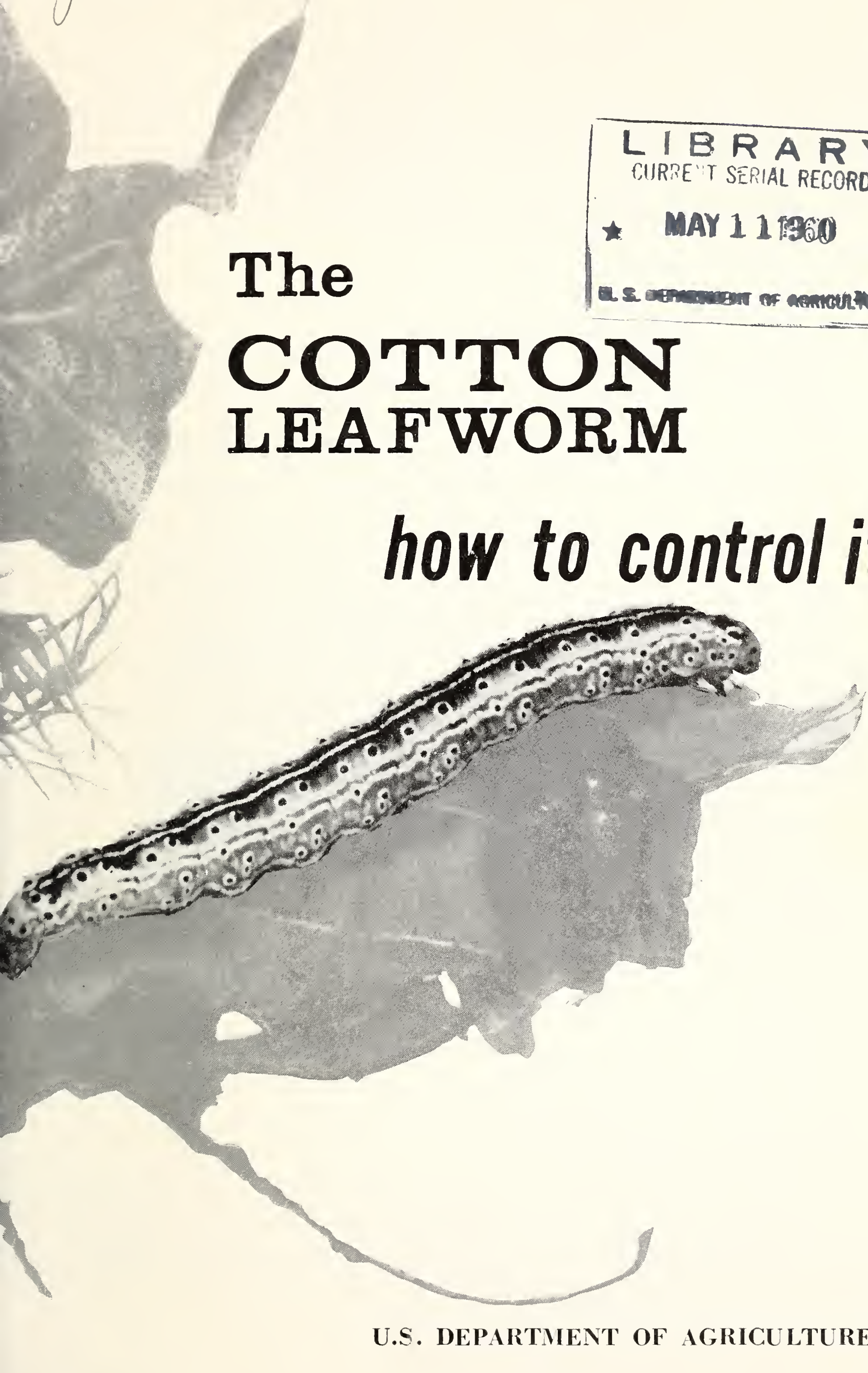
U. S. DEPARTMENT OF AGRICULTURE

The COTTON LEAFWORM

how to control it



U.S. DEPARTMENT OF AGRICULTURE

THE COTTON LEAFWORM

How To Control It

Before 1945, the cotton leafworm [1] was often one of the most destructive cotton pests. In outbreak years, supplies of insecticides used to control this pest were usually exhausted before the end of the season.

Since organic insecticides came into widespread use on cotton, in the late 1940's, the leafworm has not been a serious pest over a wide area.

This insect is a tropical species. It does not overwinter in the United States. The adults are moths; every year they fly, or are blown, into this country from Central or South America.

Each year since 1922, cotton leafworms have appeared first in southern Texas. When Florida was a major cotton-producing State, they occasionally appeared there first. Usually they arrive in this country in May; in some years they arrive in April, June, or July.

Starting in southern Texas, the leafworms spread out. By the end of a season, they usually are present in every cotton-producing State from Arizona eastward. They never have been reported from California or Nevada.

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[1] *Alabama argillacea.*

DAMAGE

Female cotton leafworm moths lay their eggs only on cotton. Eggs hatch into larvae, which are caterpillars. The caterpillars begin immediately to feed on the leaves.

Damage is first evident when the leaves start to appear ragged. Caterpillars feed between the main veins, and often skeletonize the leaves. When leaves become scarce, the caterpillars eat the bracts surrounding the squares and bolls. Finally, they may gnaw into the bolls. There is a characteristic, pungent odor in infested fields.

Early infestations, if not controlled, prevent bolls from setting.

Leafworms may cause defoliation before the crop is mature. Then, some young bolls shed; older bolls open prematurely, and the quality of both fiber and seed is lowered.

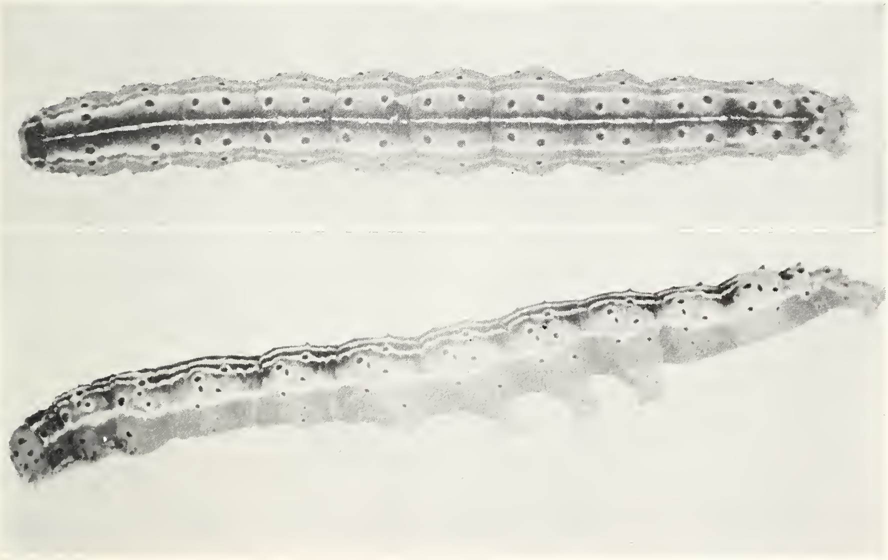
Lint often is stained by excrement from the caterpillars. Leaf skeletons become entwined in the lint, and are difficult to remove.

DEVELOPMENT

The cotton leafworm has four stages in its life cycle—egg, larva (caterpillar), pupa, and adult (moth).

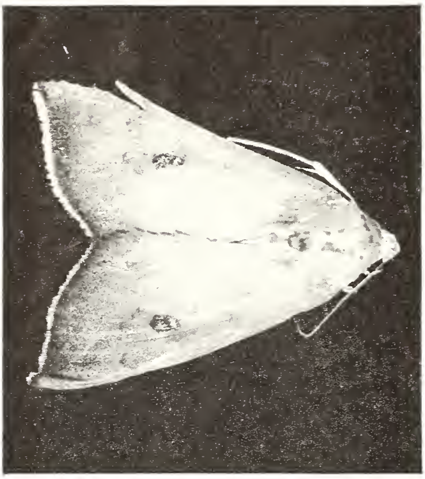
The female moth lays bluish-green eggs, singly, on the undersides of cotton leaves. In 3 or 4 days they hatch into caterpillars. Newly hatched caterpillars are pale, dingy yellow. They feed only on the undersides of leaves.

The caterpillars shed their skins five times. In summer, they usually be-



C.I.—13898 AND C.I.—13899

Top and side views of full-grown leafworm larva (caterpillar). Note the four black dots that form a square on the top of each segment.



C.I.—1392

Cotton leafworm adult (moth).

come full grown in about 2 weeks, and are about 1½ inches long. Their color varies: some are yellowish green, without prominent stripes; others have a broad, black stripe and a fine central yellow stripe down their backs. All cotton leafworm caterpillars have a distinguishing characteristic—on the top of each segment are four black dots that form a square.

When a caterpillar has completed its feeding, it "webs up" in the fold of a leaf and becomes a pupa there. Other caterpillars may eat away the leaf, leaving the pupa hanging by a thread from the leaf vein or stem.

The pupal stage lasts about 1 week in midsummer, but it may last up to 4 weeks in the fall. Then the pupa becomes a moth.

The moth is olive tan, and has a wingspread of about 1¼ inches. It is a strong flier, and frequently is found in the northernmost States and in Canada. In these areas, it feeds on ripe fruits such as peaches, grapes, and cantaloups.

The life cycle of the cotton leafworm is completed in about a month; two to eight generations may occur in a year.

NATURAL CONTROLS

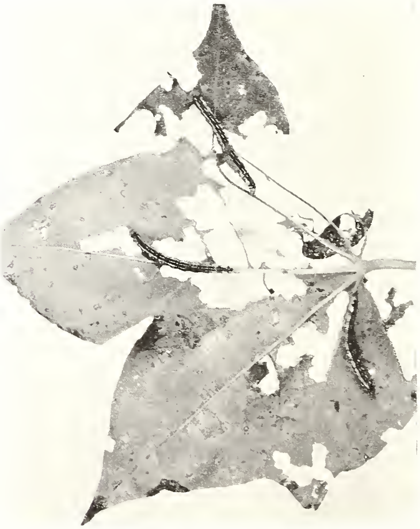
The cotton leafworm has many natural enemies that help control it.

Birds, wasps, ants, spiders, beetles, robber flies, praying mantids, and aphis lions are among the predatory enemies.

It has an egg parasite, and several pupal parasites.

Hot, dry weather causes many leafworm eggs to dry up, and the unhatched larvae die.

Diseases often destroy leafworm caterpillars.



C.I.—13907

Cotton leafworms consuming a leaf.

C.I.—13917

Clusters of leafworms completing feeding on foliage and fruit of a cotton plant.

APPLYING INSECTICIDE

If you are using insecticides in a regular program to control other cotton insects, the cotton leafworm is not likely to become a problem. Most insecticides used on cotton will kill leafworm caterpillars. If you do need to control the leafworm, apply one of the insecticides listed in the table.

Preparing Sprays

Before you prepare a spray, determine the amount of spray your equipment dispenses per acre at a given speed. Mix the concentrate with enough water to insure that the proper amount of active ingredient will be applied to each acre.

For example: If your spray machine delivers 6 gallons of spray per acre,

Insecticides, their strengths, and rates of application

Insecticide	Dusts		Sprays	
	Amount of active ingredient[1]	Amount to apply per acre	Amount of active ingredient per gallon of concentrate[1]	Amount of concentrate to apply per acre
	Percent	*Pounds*	*Pounds*	*Pints*
Calcium arsenate		7 to 10		
Endrin	2	10 to 25	1.6	1 to 2½.
Guthion	2.5	10 to 20	1.5	1⅓ to 2⅔.
Malathion	2.5	10 to 20	4	½ to 1.
Methyl parathion	2.5	10 to 20	2	1 to 2.
Parathion	1	12 to 25	2	½ to 1.
Sevin	5	10 to 20		
Strobane	20	10 to 15	6	2⅔ to 4.
Toxaphene	20	10 to 15	6	2⅔ to 4.

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[1] These are the usual commercial formulations. If you buy an insecticide of a different strength, use proportionately more or less of it.

and the recommendations specify 2 pints of concentrate per acre, you should mix 2 pints of concentrate with $5\frac{3}{4}$ gallons of water to make 6 gallons of finished spray.

Sprays or dusts are equally effective for controlling the leafworm.

Do not apply dusts when wind velocity exceeds 5 miles an hour.

Do not apply sprays by ground machines when wind velocity exceeds 15 miles an hour, or by aircraft when it exceeds 8 miles an hour.

Start applications as soon as you discover a damaging infestation. Ragged leaves, and a pungent odor in the field, usually are indications that the cotton leafworm is at work.

One application may do the job; sometimes two or more are needed. Check your fields often; repeat applications if new infestations develop.

The Extension Service in each cotton-producing State issues an annual guide for controlling cotton pests. You can get a copy at your county agricultural agent's office. Refer to this guide every year to learn whether new insecticides or improved control methods have been developed.

Precautions

Insecticides are poisonous to man and animals. Follow directions and heed all precautions on container labels.

If you get insecticide on your skin, wash it off immediately with soap and water. If you spill it on your clothing, remove clothing at once, and wash it before wearing again. As soon as you have finished using insecticide, bathe and change clothing.

Do not open containers in closed rooms. Do not leave metal containers of emulsifiable concentrates in the sun.

Empty containers are particularly hazardous. Empty bags should be burned *in the open,* or buried. Liquid containers should be crushed and buried.

Do not apply insecticides where they can drift onto pastures being grazed by livestock. Dusts are particularly dangerous in this respect.

Protect food and feed crops from the drift of insecticides being applied for cotton leafworm control.

To avoid killing honey bees and other pollinating insects, make insecticide applications, when possible, during hours when bees are not visiting the plants. Avoid drift into bee yards and adjacent crops in bloom. Notify beekeepers at least 48 hours before dusting or spraying, so that measures can be taken to protect the bees.

To protect fish and wildlife, be careful not to contaminate streams, lakes, or ponds with insecticides. Do not clean spraying equipment, or empty excess spray material, near such water.

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